

## AMENDMENT TO THE CLAIMS:

This listing of claims will replace all prior versions of claims in the application:

## LISTING OF CLAIMS:

1. (CURRENTLY AMENDED) A magnetic head, comprising:  
a free layer;  
an antiparallel (AP) pinned layer structure spaced apart from the free layer, the AP pinned layer structure includes at least two ~~Fe-containing~~ substantially pure Fe pinned layers having magnetic moments that are self-pinned antiparallel to each other, the pinned layers being separated by an AP coupling layer of Cr; and  
a high coercivity layer positioned towards the AP pinned layer structure on an opposite side thereof relative to the free layer, the high coercivity structure pinning a magnetic orientation of the AP pinned layer structure.
2. (CURRENTLY AMENDED) A head as recited in claim 1, wherein the free layer includes a layer of substantially pure Fe.
3. (ORIGINAL) A head as recited in claim 2, wherein the free layer further includes a layer of NiFe.
4. (ORIGINAL) A head as recited in claim 1, further comprising a spacer layer of Cr positioned between the free layer and the AP pinned layer structure.
5. (ORIGINAL) A head as recited in claim 4, wherein the spacer layer has a thickness of between about 15 and 25 Å.

6. (CURRENTLY AMENDED) A magnetic head as recited in claim 1,  
comprising:  
a free layer;  
an antiparallel (AP) pinned layer structure spaced apart from the free layer, the  
AP pinned layer structure includes at least two Fe-containing pinned  
layers having magnetic moments that are self-pinned antiparallel to each  
other, the pinned layers being separated by an AP coupling layer of Cr;  
and  
a high coercivity layer positioned towards the AP pinned layer structure on an  
opposite side thereof relative to the free layer, the high coercivity  
structure pinning a magnetic orientation of the AP pinned layer structure,  
wherein the high coercivity layer is formed of CoPtCr.
7. (ORIGINAL) A head as recited in claim 6, wherein the CoPtCr is formed directly on one of the Fe-containing pinned layers of the AP pinned layer structure.
8. (ORIGINAL) A head as recited in claim 1, wherein the head forms part of a GMR head.
9. (ORIGINAL) A head as recited in claim 1, wherein the head forms part of a CPP GMR sensor.
10. (ORIGINAL) A head as recited in claim 1, wherein the head forms part of a tunnel valve sensor.
11. (CURRENTLY AMENDED) A magnetic head, comprising:  
a free layer, the free layer including a layer of Fe;  
an antiparallel (AP) pinned layer structure spaced apart from the free layer, the  
AP pinned layer structure includes at least two Fe-containing pinned

layers having magnetic moments that are self-pinned antiparallel to each other, the pinned layers being separated by an AP coupling layer of Cr, wherein one of the pinned layers is thicker than another of the pinned layers;

a spacer layer of Cr positioned between the free layer and AP pinned layer structure; and  
a high coercivity layer positioned towards the AP pinned layer structure on an opposite side thereof relative to the free layer, the high coercivity structure pinning a magnetic orientation of the AP pinned layer structure.

12. (ORIGINAL) A head as recited in claim 11, wherein the free layer further includes a layer of NiFe.
13. (CURRENTLY AMENDED) A head as recited in claim 11, ~~further comprising a spacer layer of Cr positioned between the free layer and the AP pinned layer structure~~ wherein the layer of Fe in the free layer is substantially pure Fe.
14. (CURRENTLY AMENDED) A head as recited in claim ~~13~~ 11, wherein the spacer layer has a thickness of between about 15 and 25 Å.
15. (CURRENTLY AMENDED) A magnetic head as recited in claim 11, ~~comprising:~~  
a free layer, the free layer including a layer of Fe;  
an antiparallel (AP) pinned layer structure spaced apart from the free layer, the  
AP pinned layer structure includes at least two Fe-containing pinned  
layers having magnetic moments that are self-pinned antiparallel to each  
other, the pinned layers being separated by an AP coupling layer of Cr;  
a spacer layer of Cr positioned between the free layer and AP pinned layer  
structure; and

a high coercivity layer positioned towards the AP pinned layer structure on an opposite side thereof relative to the free layer, the high coercivity structure pinning a magnetic orientation of the AP pinned layer structure,  
wherein the high coercivity layer is formed of CoPtCr.

16. (ORIGINAL) A head as recited in claim 15, wherein the CoPtCr is formed directly on one of the Fe-containing pinned layers of the AP pinned layer structure.
17. (ORIGINAL) A head as recited in claim 11, wherein the head forms part of a GMR head.
18. (CURRENTLY AMENDED) A head as recited in claim 11, wherein the head forms part of a CPP GMR sensor or a tunnel valve sensor.
19. (CURRENTLY AMENDED) A head as recited in claim 11, wherein ~~the head forms part of a tunnel valve sensor~~ a total magnetic thickness of one of the pinned layers and the high coercivity layer combined is about the same as a magnetic thickness of another of the pinned layers.
20. (ORIGINAL) A magnetic storage system, comprising:  
magnetic media;  
at least one head for reading from and writing to the magnetic media, each head having:  
a sensor having the structure recited in claim 1;  
a writer coupled to the sensor;  
a slider for supporting the head; and  
a control unit coupled to the head for controlling operation of the head.
21. (ORIGINAL) A magnetic storage system, comprising:

magnetic media;  
at least one head for reading from and writing to the magnetic media, each head  
having:  
a sensor having the structure recited in claim 11;  
a writer coupled to the sensor;  
a slider for supporting the head; and  
a control unit coupled to the head for controlling operation of the head.